

NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE STANDARD

WETLAND ENHANCEMENT

(Ac.)

CODE 659

DEFINITION

The rehabilitation or re-establishment of a degraded wetland, and/or the modification of an existing wetland, which augments specific site conditions for specific species or purposes, possibly at the expense of other functions and other species.

PURPOSE

To provide specific wetland conditions to favor specific wetland functions and targeted species by:

- Hydrologic enhancement (depth duration and season of inundation, and/or duration and season of soil saturation)
- Vegetative enhancement (including the removal of undesired species, and/or seeding or planting of desired species)

CONDITIONS WHERE PRACTICE APPLIES

This practice applies on any degraded or non-degraded existing wetland where the objective is specifically to enhance selected wetland functions.

This practice does not apply to the following:

- Constructed Wetland (656), intended to treat point and non-point sources of water pollution
- Wetland Restoration (657), intended to rehabilitate a degraded wetland where the soils, hydrology, vegetative community, and biological habitat are returned to a close approximation of original conditions

- Wetland Creation (658), intended to create a wetland on a site that historically was not a wetland

CRITERIA

General Criteria Applicable to all Purposes

The soils, hydrology, and vegetative characteristics existing on the site and the contributing watershed shall be documented before enhancement of the site begins.

The purpose, goals, and objectives of the enhancement shall be clearly outlined, including the soils, hydrology and vegetation criteria that are to be met and are appropriate for the site and the project purposes.

Upon completion the site shall meet the appropriate wetland criteria and provide wetland functions and values as defined in the project's objectives.

The impact of this practice on existing non-degraded wetland functions and/or values will be evaluated. The water quality of the drainage area shall be suitable for the intended use of the wetland.

Sites suspected of containing hazardous waste shall be tested to identify appropriate remedial measures. Sites containing hazardous material shall be cleaned prior to the installation of this practice.

Invasive species, federal/state listed noxious plant species, and nuisance species (e.g.: those whose presence or overpopulation jeopardize the practice), shall be controlled on the site. This includes, but is not limited to, the manipulation of water levels or topography to control unwanted vegetation. The establishment and/or use of non-native plant species shall be discouraged.

Establish vegetative buffers on surrounding uplands around the wetlands to reduce the movement of sediment and soluble and sediment-attached substances carried by runoff. Use Filter Strip (393) to determine the minimum width of the vegetative buffer.

Dikes and excavated areas shall be shaped in a manner that is compatible with the existing landscape. For excavated areas leave the ground surface as irregular as possible.

Criteria for Hydrologic Enhancement

The hydrology of the site (defined as the rate and timing of inflow and outflow, source, duration, frequency, and depth of flooding, ponding, or saturation) shall meet the project objectives. An adequate source of water must be available to meet design needs.

Structures to control the water level shall be installed as needed for the establishment of desired hydrologic conditions for management of vegetation and for optimum wildlife use. Water levels required and the timing of changes shall be specified. Refer to Structure for Water Control (587) and Iowa Biology Technical Note 20 for guidance.

Any existing surface or subsurface drainage systems that would affect or be affected by the wetland shall be located and measures taken to determine the extent of those systems. Existing drainage systems will be utilized, removed, or modified as needed to achieve the intended purpose.

The work associated with the wetland shall not adversely affect adjacent properties or other water users, the capacity of drainage systems on other properties, and shall not back surface water onto an adjoining property unless authorized through a written easement, permit or equivalent legal document.

Refer to Wetland Restoration (657) for design criteria for subsurface drain plugging or removal, shallow water excavation, wetland dikes, and water control structures.

Criteria for Vegetative Enhancement

Establish hydrophytic vegetation typical for the wetland type(s) being established. Preference shall be given to native wetland plants with localized genetic material.

Vegetative establishment shall address species, functional, and structural diversity.

Adequate substrate material and site preparation necessary for proper establishment of the selected plant species shall be included in the design.

Where planting and/or seeding is necessary, the minimum number of native species to be established shall be based upon the type of vegetative communities present in reference wetlands and the vegetation type planned:

- Where the dominant vegetation will be herbaceous community types, a subset of the original vegetative community shall be established within 5 years; or, a suitable precursor to the original community will be established within 5 years that creates conditions suitable for the establishment of the native community. Species richness and evenness shall be addressed in the planning of herbaceous communities.
- Where the dominant vegetation will be forest or woodland community types, vegetation establishment will include a minimum of six species.

Seeding rates shall be based upon percentage of pure live seed tested within 6 months of planting.

Where known nutrient and pesticide contamination exists, the species selected will be tolerant of these conditions.

To decide if natural revegetation is appropriate, refer to Wetland Restoration, Enhancement, and Management for natural regeneration decision keys. Where natural revegetation is chosen and pre-identified selected species will realistically dominate within 5 years, then sites may be left to revegetate naturally. If a site has not become dominated by the targeted species within 5 years, active forms of revegetation may be required.

Where topsoil will be used as a seedbank, topsoil shall not be stockpiled prior to redistribution during the summer. For other periods, topsoil shall be stockpiled in a manner to limit deterioration of viable plant parts and seeds. Refer to Wetland Restoration, Enhancement, and Management for guidance.

Applicable guidelines for hydrophytic vegetation establishment can be found in Iowa Biology Technical Note 9, Iowa Biology Job Sheet 3, Conservation Cover (327), Tree/Shrub Establishment (612), Restoration and Management of Declining Habitats (643), Wetland Wildlife Habitat Management (644), Wetland Restoration, Enhancement, and Management, and NEH, Part 650, Chapter 13, Wetland Restoration, Enhancement, or Creation.

If uplands are planned as part of a wetland creation, then native seedlings shall be used for these areas as well. Refer to Conservation Cover (327) for herbaceous restorations or Tree/Shrub Establishment (612) and Upland Wildlife Habitat Management (645) if trees and/or shrubs are desired.

CONSIDERATIONS

Dike (356), Wetland Restoration (657), and Structure for Water Control (587) may be used to enhance the performance of this practice.

Consider manipulation of water levels to control unwanted vegetation or to enhance desirable vegetation.

Deep tillage or other methods can be used to expose the buried seedbank or bring the buried seedbank to the surface.

Consider establishing herbaceous vegetation by a variety of methods over the entire site, or a portion of the site, at appropriate densities and depths.

Consider effect enhancement will have on disease vectors such as mosquitoes.

The inclusion of microtopography can achieve changes in depth and duration of flooding without changing extent of surface area.

Consider effect of volumes and rates of runoff, infiltration, evaporation and transpiration on the water budget.

Consider effects on downstream flows or aquifers that would affect other water uses or users.

Consider effects on wetlands and water-related resources, including fish and wildlife habitats, which would be associated with the practice.

Consider linking wetlands by corridors of vegetation or habitat wherever appropriate to

enhance the wetland's use and colonization by the native flora and fauna.

Consider effects on temperature of water resources to prevent undesired effects on aquatic and wildlife communities.

Soil disturbance associated with the installation of this practice may increase the potential for invasion by unwanted species.

Consider adding 1 to 2 dead snags, tree stumps, or logs per acre to provide structure and cover for wildlife. As an additional carbon source for food chain support, detrital material can be spread throughout the basin.

For discharge wetlands, consider underground upslope water and/or groundwater source availability.

Consider microtopography and hydroperiod when determining which species to plant.

Consider the effect of water control structures on the ability of aquatic species to move in and out of the wetland.

Consider impact that water surface draw-downs will have on concentrating aquatic species such as turtles into diminished pool area resulting in increased mortality.

Consider timing of water control to mimic the hydrologic seasonality of the area, further enhancing the habitat for aquatic species.

Consider design modifications that will limit potential negative impacts of wetland plants and animals on the project.

Consider controlling water levels to prevent oxidation of organic soils and inundated organic matter and materials.

PLANS AND SPECIFICATIONS

Plans and specifications for this practice shall be prepared for each site. Specifications shall be recorded using approved specifications sheets, job sheets, narrative statements in the conservation plan, or other documentation. The following list of Construction Specifications is intended as a guide to selecting the appropriate specifications for each specific project. The list includes most, but may not contain all, of the specifications needed for a specific project:

- IA-1 Site Preparation
- IA-3 Structure Removal
- IA-5 Pollution Control

IA-6	Seeding and Mulching for Protective Cover
IA-9	Drainage Tile Investigation and Removal
IA-11	Removal of Water
IA-21	Excavation
IA-23	Earthfill
IA-26	Topsoiling
IA-27	Diversions
IA-45	Plastic (PVC, PE) Pipe
IA-46	Tile Drains for Land Drainage
IA-51	Corrugated Metal Pipe
IA-52	Steel Pipe Conduits
IA-61	Loose Rock Riprap
IA-81	Metal Fabrication and Installation
IA-83	Timber Fabrication and Installation
IA-95	Geotextile

OPERATION AND MAINTENANCE

An operation and maintenance (O&M) plan will be prepared for each wetland site. Specified actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance). The following activities shall be addressed in the plan:

- Timing and level setting of water control structures required for establishment of desired hydrologic conditions or for management of vegetation.
- Inspection schedule of dikes and structures for damage assessment.
- Depth of sediment accumulation allowed before removal is required.
- Management needed to maintain vegetation, including control of unwanted vegetation in and around the wetland area.
- Acceptable uses and timing (e.g.: grazing and haying).

Any use of fertilizers, mechanical treatments, prescribed burning, pesticides, and other chemicals shall assure that the intended purpose of the wetland restoration shall not be compromised.

Biological control of undesirable plant species and pests (e.g.: using predator or parasitic species) shall be implemented where available and feasible.

REFERENCES

Invasive Species, Executive Order 13112, February 3, 1999, Federal Register: Vol. 64, No. 25

Impact of a Controlled Wetland Drawdown on Blanding's Turtles in Minnesota, Chelonian Conservation Biology, Vol. 3, No. 4

Habitat Management Guidelines for Reptiles and Amphibians of the Midwest, Partners for Amphibian and Reptile Conservation

Functional Requirements and Design Parameters for Restocking Coarse Woody Features in Restored Wetlands, ASAE Meeting, Presentation Paper No. 012059

USDA-NRCS, Designing Areas for Wildlife, Iowa Biology Technical Note 9

USDA-NRCS, Creation of Waterfowl Nesting Islands, Iowa Biology Technical Note 19

USDA-NRCS, National Engineering Handbook, (NEH), Part 650, Engineering Field Handbook (EFH), Chapter 13

USDA-NRCS, Wetland Vegetation and Water Management Considerations, Iowa Biology Technical Note 20

USDA-NRCS, Shallow Water Excavation for Wildlife, Iowa Biology Technical Note 24

USDA-NRCS, Wetland Restoration, Enhancement, and Management, Wetland Science Institute